

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

CU-2328 TFP

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

**09/622249**INTERNATIONAL APPLICATION NO.  
PCT/AU99/00094INTERNATIONAL FILING DATE  
18 February 1999PRIORITY DATE CLAIMED  
18 February 1998TITLE OF INVENTION  
CHAIR INCORPORATING AIR CUSHIONSAPPLICANT(S) FOR DO/EO/US  
Peter Alan SMITH

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:  
\*Small Entity Statement

Express Mail Label No.  
EL624334490US

17. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$970.00International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$840.00International preliminary examination fee (37 CFR 1.482) not paid to USPTO but  
international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$690.00International preliminary examination fee paid to USPTO (37 CFR 1.482)  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$670.00International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$96.00**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS** PTO USE ONLY

\$ 970.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	21 - 20 =	1	X \$18.00
Independent claims	1 - 3 =	0	X \$78.00

\$ 18.00

\$ 0

MULTIPLE DEPENDENT CLAIM(S) (if applicable)

+ \$260.00

\$ 260.00

**TOTAL OF ABOVE CALCULATIONS =**

\$ 1248.00

Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement  
must also be filed (Note 37 CFR 1.9, 1.27, 1.28).

\$ 624.00

**SUBTOTAL =**

\$ 624.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

**TOTAL NATIONAL FEE =**

\$ 624.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

**TOTAL FEES ENCLOSED =**

\$ 624.00

Amount to be

refunded:

\$

charged:

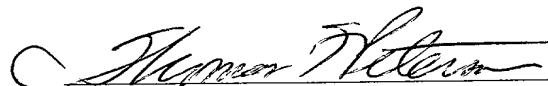
\$

a. ☒ A check in the amount of \$ 624.00 to cover the above fees is enclosed.b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 12-0400. A duplicate copy of this sheet is enclosed.**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO

Ladas & Parry  
224 South Michigan Avenue  
Chicago, Illinois 60604  
(312) 427-1300

August 15, 2000



SIGNATURE:

Thomas F. Peterson

NAME

24790

REGISTRATION NUMBER

# PATENT REGISTRATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Peter Alan Smith  
 Pat. No. :  
 Dated :  
 Serial no. :  
 Filed :  
 For : Chair Incorporating Air Cushions  
 Group Art Unit :  
 Examiner :  
 Docket :

The Commissioner of Patents and Trademarks  
 Washington, D.C. 20231

### VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(c-f) and 1.27(b-d))

With respect to the invention described in

- ☐ the specification filed herewith.  
☒ application serial no. PCT/AU99/00094 filed 18/2/99  
☐ patent no. issued

#### I. IDENTIFICATION OF DECLARANT AND RIGHTS AS A SMALL ENTITY

I hereby declare that I am

##### (a) Independent Inventor

- ☒ a below named independent inventor and that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code to the Patent and Trademark Office.

##### (b) Non-Inventor Supporting a Claim By Another

- ☐ making this verified statement to support a claim by for a small entity status for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code and I hereby declare that I would qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under 41(a) and (b) of Title 35, United States Code, if I had made the above identified invention.

##### (c) Small Business Concern

- ☐ the owner of the small business concern identified below:  
☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN \_\_\_\_\_  
 ADDRESS OF CONCERN \_\_\_\_\_

and that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of the Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

**(d) Non-Profit Organization**

☐ an official empowered to act on behalf of the non-profit organization identified below:

NAME OF ORGANIZATION \_\_\_\_\_

ADDRESS OF ORGANIZATION \_\_\_\_\_

**TYPE OF ORGANIZATION**

- ☐ UNIVERSITY OR OTHER INSTITUTION OF HIGHER EDUCATION
- ☐ TAX EXEMPT UNDER INTERNAL REVENUE SERVICE CODE (26 USC 501(a) AND 501(c)(3))
- ☐ NON-PROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA  
(NAME OF STATE \_\_\_\_\_)  
(CITATION OF STATUTE \_\_\_\_\_)
- ☐ WOULD QUALIFY AS TAX EXEMPT UNDER INTERNAL REVENUE SERVICE CODE (26 USC 501(A) AND 501(C)(3)) IF LOCATED IN THE UNITED STATES OF AMERICA
- ☐ WOULD QUALIFY AS NON-PROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA IF LOCATED IN THE UNITED STATES OF AMERICA  
(NAME OF STATE \_\_\_\_\_)  
(CITATION OF STATUTE \_\_\_\_\_)

and that the non-profit organization identified above qualifies as a non-profit organization as defined in 37 CFR 1.9(e) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code.

**II. OWNERSHIP OF INVENTION BY DECLARANT**

I hereby declare that rights under contract or law remain with and/or have been conveyed to the above identified

- ☐ person (item (a) or (b) above)      ☐ concern (item (c) above)      ☐ organization (item (d) above)

EXCEPT, that if the rights held are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held (1) by any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, (2) any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or (3) a non-profit organization under 37 CFR 1.9(e).

- ☐ no such person, concern, or organization
- ☐ person, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL      ☐ SMALL BUSINESS CONCERN      ☐ NON-PROFIT ORGANIZATION

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL      ☐ SMALL BUSINESS CONCERN      ☐ NON-PROFIT ORGANIZATION

**III. ACKNOWLEDGMENT OF DUTY TO NOTIFY PTO OR STATUS CHANGE**

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

**IV. DECLARATION**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing hereon, or any patent to which this verified statement is directed.

**V. SIGNATURES COMPLETE ONLY (e) or (f) BELOW****(e)****NOTE:** All inventors must sign the verified statement

Peter Alan Smith  
Name of Inventor

Pete Smith  
Signature of Inventor

14/8/2000  
Date

\_\_\_\_\_  
Name of Inventor

\_\_\_\_\_  
Signature of Inventor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name of Inventor

\_\_\_\_\_  
Signature of Inventor

\_\_\_\_\_  
Date

or

**(f)****NOTE:** The title of the person signing on behalf of a concern or non-profit organization should be specified.

NAME OF PERSON SIGNING \_\_\_\_\_

TITLE OF PERSON \_\_\_\_\_

(if signing on behalf of a concern or non-profit organization)

ADDRESS OF PERSON SIGNING \_\_\_\_\_

DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_

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4/PR+9

528 Rec'd

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15 AUG 2000  
PCT/AU99/00094CHAIR INCORPORATING AIR CUSHIONSFIELD OF THE INVENTION

This invention relates to a chair construction that incorporates air-containing cushions. The invention has  
5 been developed in the context of so-called nursing chairs and is hereinafter described in this context. However, it will be understood that the invention does have broader application, for example to lounge chairs and office chairs. It should also be understood that the term  
10 "chairs" as used in this specification is to be construed as including lounges, settees and such other seating items as have seat and backrest portions.

BACKGROUND OF THE INVENTION

Numerous attempts have been made to create chairs that  
15 provide appropriate support and comfort for invalids and aged persons who are confined to the chairs for protracted periods. Those persons must be supported in such a way that their body mass is distributed more-or-less evenly over the area of supporting cushions, so as to avoid  
20 traumatic pressure points. This means that supporting cushions must function to conform with the shape of seated persons and, whilst this might be made possible if chairs were to be tailored to the requirements of individual persons, this clearly is not practicable. The simple fact  
25 is that any given chair might be used by a number of different persons having different physical sizes, shapes and body masses.

Attempts have been made to accommodate the special needs of aged and invalid persons by the development of  
30 water chairs. These have taken various forms and the most successful of them has been constructed with a number of separate bladder-like bags, each of which is partially filled with water. The bags are fitted together and located below upholstery material, and the water within  
35 each bag is displaceable to accommodate body shapes of persons who are supported by the chairs.

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The water chairs have proved to be very successful in nursing homes and other places where aged persons and long term invalids are accommodated. However, the chairs have two problems; they have a potential to leak water with damage to and aging of the water-containing bags and, perhaps more importantly, they are extremely heavy due to the weight of water (typically 20 to 30 kilograms) that is required to provide full support for a range of differently sized people. The latter problem requires that the chairs be mounted on large size wheels, not just casters or glides, and even then the chairs are found by nursing personnel to be difficult to manoeuvre.

The chair which is the subject of the present invention has been developed in an attempt to achieve a substantial weight reduction whilst retaining the recognised benefits of water chairs. This has led the inventor to consider air as an alternative to water.

So-called blow-up air beds have long been used for recreational purposes, and inflatable cushions and neck supports, both in a variety of shapes, are used regularly by travellers in aircraft and road vehicles to provide seat cushioning and neck support. However, all of these known inflatable beds and cushions normally are used in a fully inflated or near-fully inflated state. That is they normally are filled with air to a level at which they are elastically stressed or to an extent approaching that level, and they rely upon the compressible nature of air to provide comfortable (or as comfortable as possible) body support.

Chairs which have air-inflated cushions also have been developed or, at least, disclosed, for example in patent specifications numbered AU-B-14164/83, AU-A-10206/95 and WO96/02402. However, these publications disclose chair cushions that are inherently complex, in some cases employing multi-compartmented structures, and the cushions are filled with air to a level at which elastic stress

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occurs.

#### SUMMARY OF THE INVENTION

The present invention seeks to provide an air cushioning arrangement that is appropriate to chairs, which avoids the complexities of prior art approaches and which provides for shape adaptation as a consequence of air displacement within containing cushions.

The invention may be defined broadly as providing a chair having a seat portion and a backrest portion. The chair comprises seat and backrest support structures, at least one air-containing cushion positioned on the seat support structure, at least one air-containing cushion secured to the backrest support structure, a layer of compressible material overlying the cushions, and an upholstery material covering the layer of compressible material. Each cushion comprises a bladder which is formed from a pliable, gas impermeable material and each bladder is charged with air in an amount not greater than 60% of the maximum contained volume of the bladder, whereby the air may freely be displaced within the bladder and, as a consequence, shaping may be imparted to the cushion to complement that of a person who occupies the chair.

In the context of this specification the expression "maximum contained volume" is to be understood as meaning the maximum volume to which the bladder may be inflated without experiencing elastic stress.

#### PREFERRED FEATURES OF THE INVENTION

Each bladder preferably is charged with air in an amount not greater than 50% of the maximum contained volume of the bladder and, most preferably, to an amount within the range 15% to 30% of the maximum contained volume of the bladder. In some cases, depending upon the intended use of the chair, respective ones of the bladders may be charged with air to different levels. The extent to which each bladder is required to be charged with air may initially be determined empirically for different chair structures or



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uses.

When charged with air, each bladder is closed against inflow or outflow of air. The bladder may be sealed closed in a permanent manner, although it is preferred that the bladder be provided with a valve through which air may be admitted as and when required.

The compressible material that is used to overlay the cushions may comprise a matted filamentary material or an expanded foam plastics sheet material. The main function of the compressible material is to create a smooth or uniform contour over which to lay the upholstery material. However, it is important that the compressible material and the upholstery material be fitted to the chair in such a way that they and the cushions may move together to assume a shape that complements that of a support person. That is, it is essential that air contained within each of the bladders should be free to move into free space within the bladders and that the covering materials should not act to constrain re-shaping of the cushion during air movement.

The seat portion of the chair will normally support a single cushion but the backrest portion may be fitted with one or more cushions, depending upon the size of the chair and its intended function. The chair cushions may be butted together but they preferably are arranged so that they overlap one another. That is, when the backrest portion is fitted with two cushions, the upper cushion will overlap the lower cushion. Then, the lower cushion will be arranged to overlap the seat cushion. The cushion (or the higher cushion) that is fitted to the backrest portion preferably is arranged to extend over and around the upper edge of the backrest portion of the chair, so as to provide air support for the neck region of a person seated on the chair.

Expanded foam sheet material may be located below one or more of the cushions for the purpose of providing additional load support to a seated person or for providing

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support in the unlikely event of air being displaced from one or more of the bladders. Also, when the expanded foam sheet material is located both below and above the cushions, that which is located below the cushions preferably is more dense than that which is located above the cushions.

The upholstery material may comprise leather, fabric or a plastics sheet material, depending upon the intended use of the chair. It is preferred in respect of nursing chairs that are intended for use with persons who may be incontinent that the upholstery material be composed of a semi-permeable or vapour permeable plastics sheet material.

When in the form of a nursing chair the backrest support structure preferably is pivotably mounted with respect to the seat support structure. Also, the seat support structure preferably is mounted to or integrated with a support base which, in turn, preferably is carried by wheels or rollers.

Furthermore, when the chair is in the form of a nursing chair, it preferably comprises a leg support portion that is pivotably mounted with respect to the seat portion and, in such case, an air-containing bladder-form cushion will be mounted to the leg rest portion.

The chair may be fabricated by using timber framing, but the chair preferably is formed with a metal frame which is fitted with reinforced plastics sheet material to form the seat and backrest support structures and to carry the cushions.

The cushions may be removably secured to the seat and backrest support structures by way of self-securing fastening material such as that which is sold under the Velcro trade mark. Also, the upholstery material may itself be secured in place by use of similar self-securing fastening material.

The invention will be more fully understood from the following description of a relatively simple example of a

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metal-framed nursing chair that has been developed to incorporate the invention. The description is provided with reference to the accompanying (largely diagrammatic) line drawings.

5 BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Figure 1 shows an exploded perspective view of the metal frame of the nursing chair with all cushions and upholstering material removed from the chair.

10 Figure 2 shows a perspective view of one corner of the chair as seen in the direction of arrow A in Figure 1, the view showing a portion of padding material and seat support material.

15 Figure 3 shows, in perspective, a partial view of the chair when fitted with air-containing cushions and an underlay.

Figure 4 shows a side view of the chair when fitted with air-containing cushions, an underlay, an overlay and upholstering material.

20 Figure 5 shows a view similar to Figure 4 but when the chair is accommodating a seated person.

DETAILED DESCRIPTION OF PREFERRED FORM OF THE INVENTION

25 As illustrated, in particular in Figures 3 to 5, the chair includes a seat portion 10, a backrest portion 11 and a leg support portion 12. The complete chair is built upon an integral tubular metal frame 13 which is shown in Figure 1.

30 The frame has a support base 14 which is mounted to floor engaging wheels 15. Two brackets 16 are welded to tubular side rails 17 of the support base and provide bearings 18 for a seat support frame structure 19. The seat support frame structure 19 is pivotably mounted to the support base and telescopic gas struts (not shown) interconnect the support base and the seat support frame structure 19 to provide for controlled tilting of the whole  
35 seat portion 10 relative to the support base 14.

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The seat support frame structure 19 has upper and lower side rails 20 and 21, and cross rails 22. The upper side rails form the structural parts of armrests of the chair and, for this purpose, the side rails carry expanded foam plastics padding material 23 which is shown in part in Figure 2. As will be later described, similar foam plastics sheet material is secured to other parts of the structure and is overlaid with upholstering material in the finished chair.

A fibre reinforced plastics sheet material 24 is provided to extend between the lower side rails 21 of the seat support frame structure for carrying seat cushioning material (referred to in more detail later). A similar fibre reinforced plastics sheet material 25 (a portion of which is shown in Figure 1) is provided on a backrest frame portion 26 for supporting backrest cushioning.

The seat support frame structure 19 is provided with pivot bearings 27 to match the bearings 18 on the support base 14. Similar pivot bearings 28 and 29 are provided on the seat support frame structure 19 for pivotably mounting the backrest frame portion 26 and a leg support frame portion 30.

The leg support frame portion 30 comprises a generally rectangular frame that, like the rest of the structure, is formed from tubular metal, and it is pivotably mounted to the seat support frame structure 19 by way of pivot bearings 31. The leg support frame portion is fitted with expanded foam type plastics material sheet 32 for carrying leg support cushioning.

The backrest frame portion 26 is formed from tubular metal predominantly as a rectangular frame but it includes a lower angled portion which carries pivot bearings 33. It also includes triangular-shape side portions 34 which are formed from tubular metal and which are fitted with expanded foam padding material (not shown) to form side wings of the chair when finally upholstered.

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The backrest frame portion 26 of the chair is connected to the seat support frame portion 19 by telescopic gas struts (not shown), so as to permit pivotal movement of the backrest of the chair relative to the seat portion of the chair.

With the chair structure as described thus far, each of the seat portion, backrest portion and leg support portion may be pivoted one relative to the other so that the chair may be placed in any disposition ranging from a bed through to an upright chair. Also, the entire structure may be pivoted about the support base 14 to facilitate entry and exit of invalid persons from the chair.

As shown in Figures 3 and 4, a single underlay 35 that is formed from expanded foam sheet material, is laid on and secured to the supporting sheet materials 24 and 25. A single air cushion 36 is carried by the portion of the underlay 35 that is positioned on the supporting material 24. Also, two air cushions 37 and 38 are secured to the backrest sheet material 25, and a single air cushion 39 is secured to the expanded foam sheet material 32 that is carried by the leg support frame portion 30 of the chair.

Each of the air cushions 36 to 38 is formed from a bladder having side walls as well as front and back walls, such that the cushion would assume a generally oblong shape if charged with air in an amount equal to the maximum contained volume of the bladder. The bladders are fabricated from pliant air impermeable plastics sheet material having a thickness within the range 0.25 to 1.00 millimetre, and all seams of the bladders are closed by welding or gluing to effect complete sealing. Valves 40 are provided in one side wall of each of the bladders 36 to 38 to enable air to be delivered to and bled from the cushion which is constituted by the bladder.

The cushion 39 is also formed from a bladder but in this case the bladder has a flatter, less oblong shape (if

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it were to be charged to its maximum contained volume) than the other bladders 36 to 38. Also, an air admitting valve is located in one edge seam of the bladder that, when charged with air, constitutes the cushion 39.

5 As indicated previously, it is important that the bladders be charged with air in an amount not greater than 50% to 60% of the maximum contained volume of the bladders and, more usually, in an amount within the range 15% to 30% of the maximum contained volume of the bladders. The  
10 actual amount of air will be determined in any given case by the position of the cushion, the amount of foam plastics sheet material cushioning that is used in conjunction with the cushions and the resiliency of the upholstering material which is used to overlay the cushions.

15 The cushions 36 to 39 are fitted closely together, in overlapping relationship, as indicated in Figure 4, in order that they might be caused to meld together when adapting to the shape of a seated person, as indicated in Figure 5. The upper backrest cushion 38 is extended over  
20 (ie, wrapped around) the top of the backrest frame portion 26 to provide air cushioned support for the neck and head of a seated person. Similarly, the leg support cushion 39 is wrapped around the front and rear sides of the leg support frame portion 30.

25 The cushions 36 to 39 are removably secured to the underlays 32 and 35 by a self-securing fastening material such as that which is sold under the Velcro trade mark.

As shown in Figure 4, an overlay 41 in the form of a continuous length of relatively soft, compressible material  
30 is laid along the full length and height of the chair, to cover the leg support portion, the seat portion and the backrest portion of the chair. The overlay 41 is formed from an expanded foam plastics sheet material that is less dense than the material from which the underlay 35 is  
35 formed.

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Upholstering material 42 is used to cover the entire chair and, for convenience, this material may also be held in place by self-securing fastening material.

- 5 Variations and modifications may be made in respect of the invention as above described and defined in the following claims.

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THE CLAIMS

1. A chair of a type having a seat portion and a backrest portion, the chair comprising a seat support structure, a backrest support structure, at least one air-containing cushion positioned on the seat support structure, at least one air-containing cushion secured to the backrest support structure, a layer of compressible material overlaying the cushions, and an upholstery material covering the layer of compressible material; each cushion comprising a bladder which is formed from a pliable, gas impermeable material and each bladder being charged with air in an amount not greater than 60% of the maximum contained volume of the bladder whereby the air may freely be displaced within the bladder and, as a consequence, shaping may be imparted to the cushion to complement that of a person who occupies the chair.
2. The chair as claimed in claim 1 wherein each bladder is charged with air in an amount not greater than 50% of the maximum contained volume of the bladder.
3. The chair as claimed in claim 1 wherein each bladder is charged with air in an amount between 15% and 30% of the maximum contained volume of the bladder.
4. The chair as claimed in claim 1 wherein respective ones of the bladders are charged with air to different levels falling within the range 15% to 60% of the maximum contained volume of the respective bladders.
5. The chair as claimed in any one of claims 1 to 4 wherein each bladder is provided with a valve through which air is admitted to the bladder.
6. The chair as claimed in any one of claims 1 to 5 wherein each bladder has a front wall, a back wall and peripheral side walls whereby the bladder would assume a generally oblong shape if it were charged with air in an amount equal to the maximum contained volume of the bladder.



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7. The chair as claimed in any one of claims 1 to 6 wherein the compressible material that overlays the cushions comprises an expanded foam plastics material sheet.

5 8. The chair as claimed in any one of the preceding claims wherein two of the air-containing cushions are secured to the backrest support structure, one above the other.

10 9. The chair as claimed in claim 8 wherein an upper one of the backrest support structure cushions overlaps the lower one of the backrest support cushions, and wherein the lower one of the backrest support cushions overlaps the cushion that is positioned on the seat support structure.

15 10. The chair as claimed in claim 8 or claim 9 wherein the upper one of the backrest support cushions extends over and around an upper edge of the backrest portion of the chair.

20 11. The chair as claimed in any one of the preceding claims wherein an underlay which is formed from an expanded foam sheet material is located below the air-containing cushions.

12. The chair as claimed in claim 11 wherein the underlay is formed from a material that has a higher density than that of the compressible material that overlays the cushions.

25 13. The chair as claimed in any one of the preceding claims wherein the upholstery material is composed of a semi-permeable or vapour-permeable plastics sheet material.

30 14. The chair as claimed in any one of the preceding claims wherein the backrest support structure is pivotably mounted with respect to the seat support structure.

15. The chair as claimed in any one of the preceding claims wherein the seat support structure is mounted to a support base which is carried by wheels.

35 16. The chair as claimed in claim 15 wherein the seat support structure is pivotably mounted with respect to the support base.

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17. The chair as claimed in any one of the preceding claims wherein a leg support portion is pivotably mounted with respect to the seat portion and wherein an air-containing cushion is mounted to the leg support portion and is overlaid by both the compressible material and the upholstery material.

18. The chair as claimed in any one of the preceding claims wherein the seat support structure and the backrest support structure are formed as metal frames and wherein the metal frames carry reinforced plastics sheet material which support, either directly or indirectly, the air-containing cushions.

19. The chair as claimed in any one of the preceding claims wherein the cushions are removably secured to the seat and backrest support structures by way of self-securing fastening materials.

20. The chair as claimed in any one of the preceding claims wherein the upholstery material is secured in place by the use of self-securing fastening materials.

21. The chair substantially as shown in the accompanying drawings and substantially as hereinbefore described with reference thereto.

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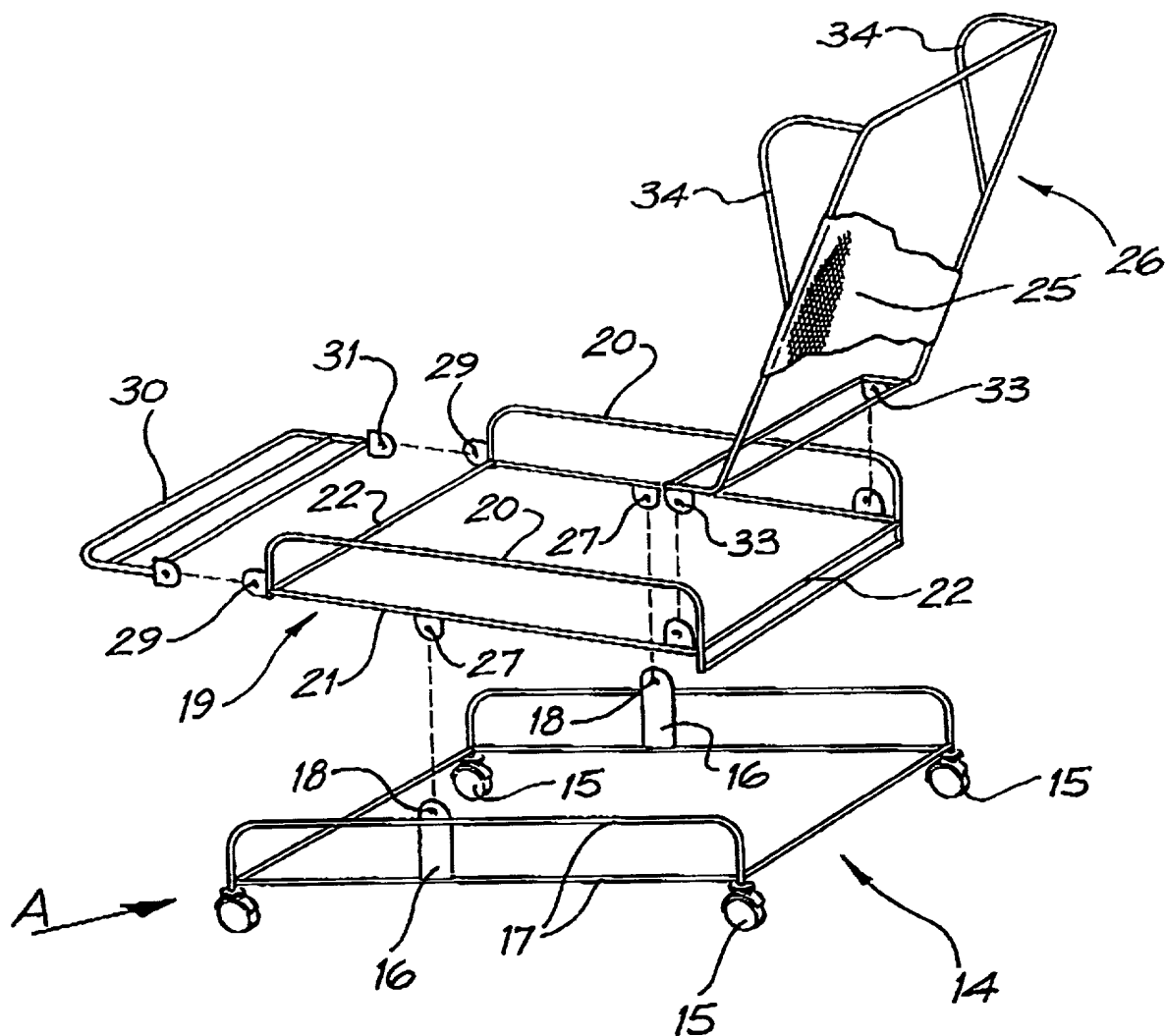


FIG. 1

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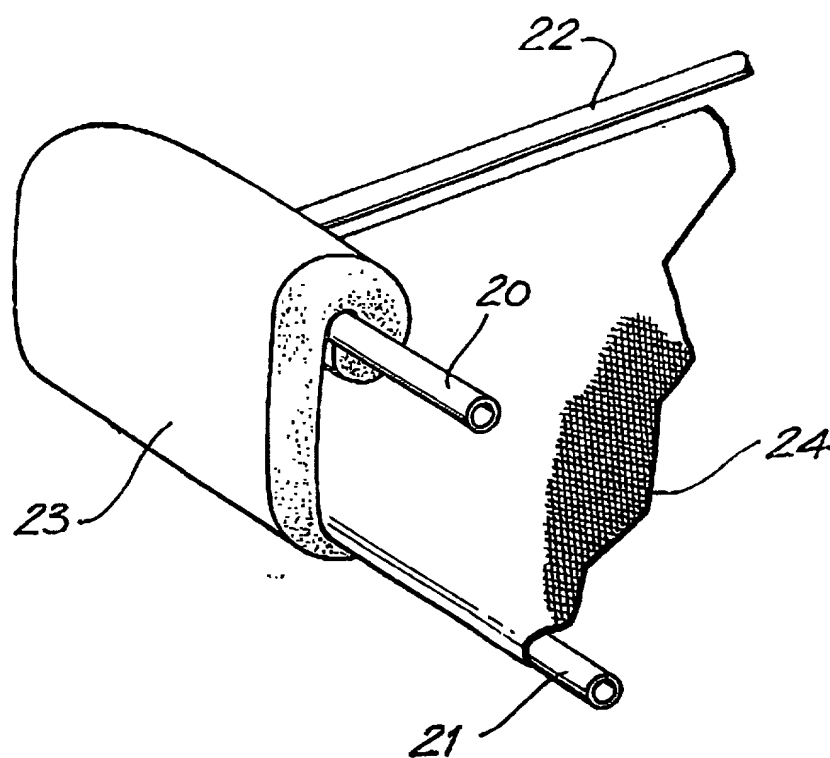


FIG. 2

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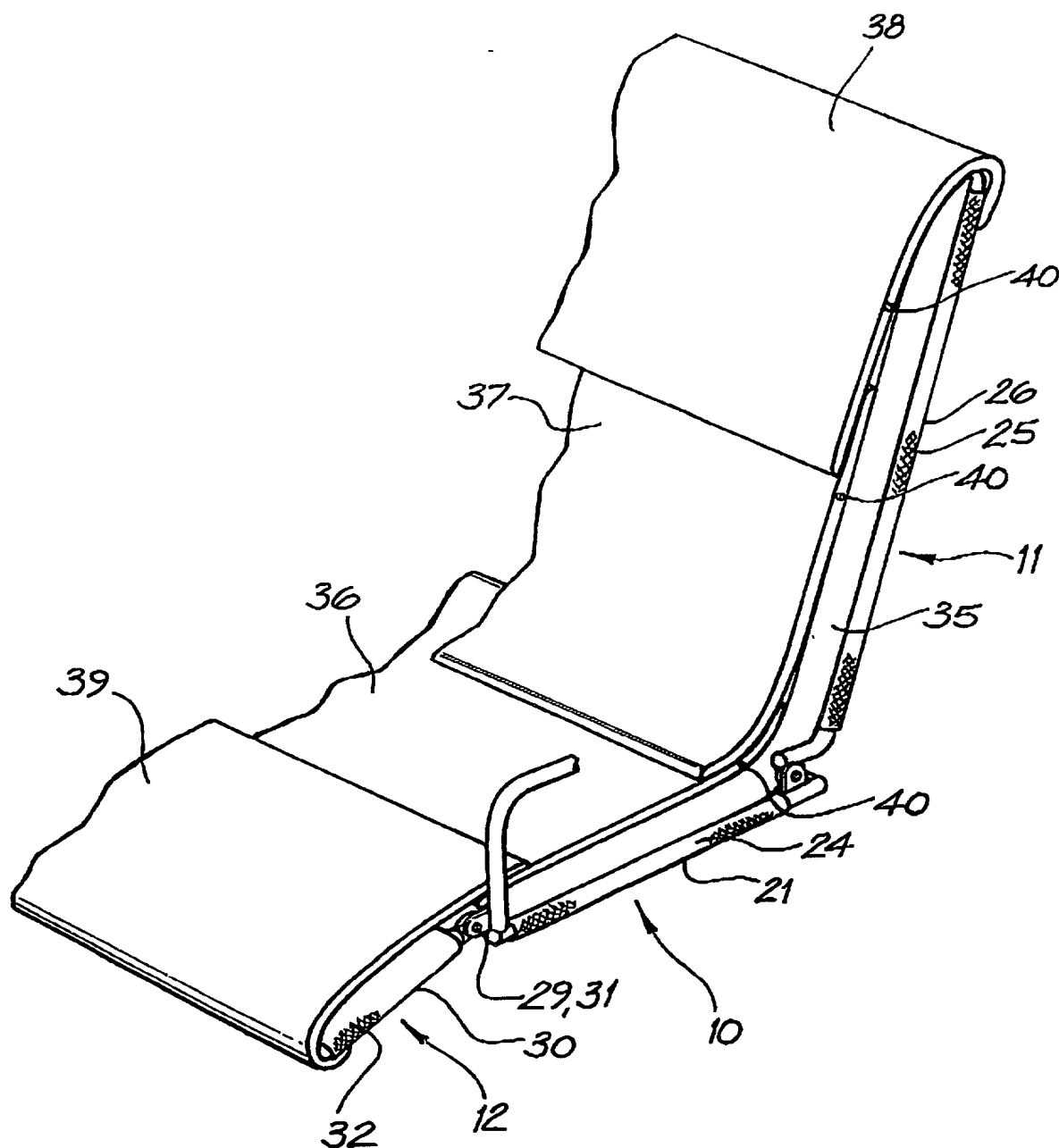


FIG. 3

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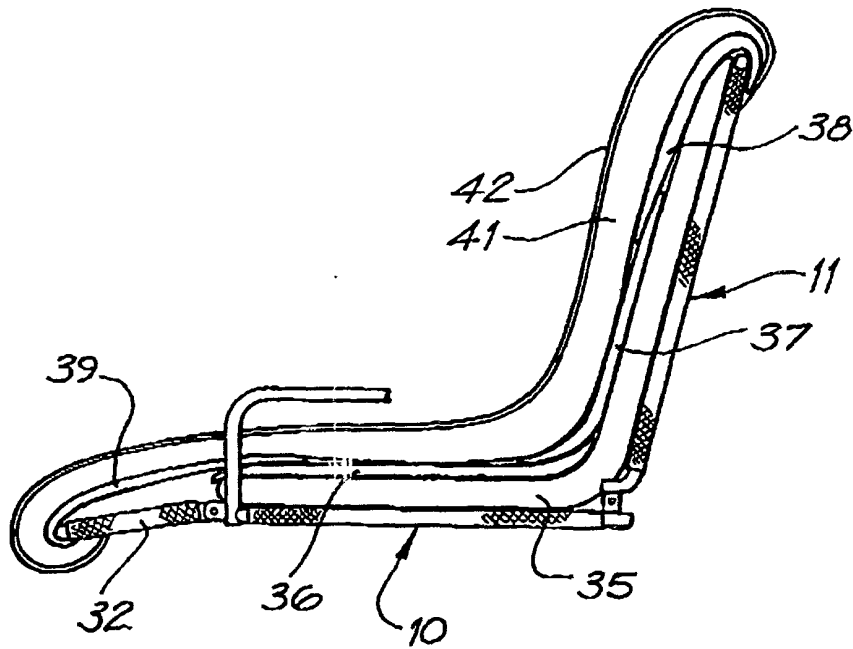


FIG. 4

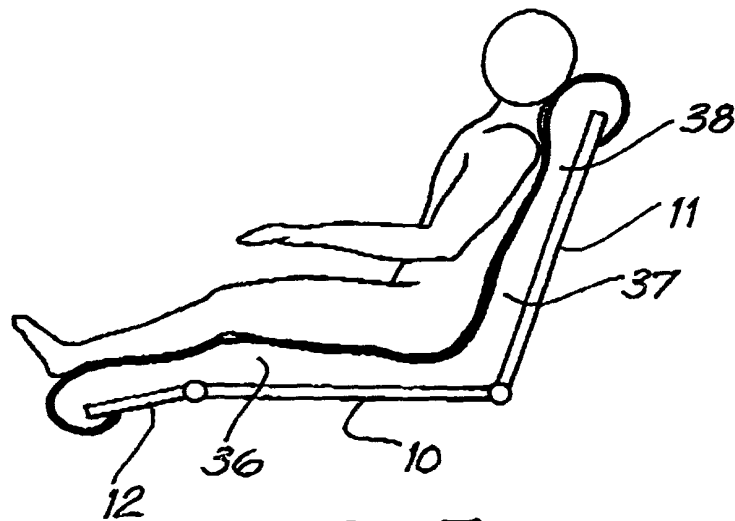


FIG. 5

## SIGNATURE(S)

Note: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

## Full name of sole or first inventor

Peter Alan Smith  
(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature Peter

Date 14/08/2000 Country of Citizenship Australia

Residence 3/19-21 Wilson Street Botany NSW 2019 Australia

Post Office Address As Above

## Full name of second joint inventor, if any

(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_

## Full name of third joint inventor, if any

(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_

## PATENT

Docket:

**COMBINED DECLARATION AND POWER OF ATTORNEY**(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION OR CIP)

As a below named inventor, I hereby declare that:

**TYPE OF DECLARATION**

This declaration is of the following type: (check one applicable item below)

- ☐ original  
☐ design  
☐ supplemental

Note: If the Declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

- ☒ national stage of PCT

Note: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR CIP.

- ☐ divisional  
☐ continuation  
☐ continuation-in-part (CIP)

**INVENTORSHIP IDENTIFICATION**

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

**TITLE OF INVENTION**

CHAIR INCORPORATING AIR CUSHIONS

**SPECIFICATION IDENTIFICATION**

the specification of which: (complete (a), (b) or (c))

- ☐ (a) is attached hereto.  
☐ (b) was filed on \_\_\_\_\_ as ☐ Serial No. \_\_\_\_\_ or ☐ Express Mail No. (as Serial No. not yet known) \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

Note: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the Declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental Declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

- ☒ (c) was described and claimed in PCT International Application No. PCT/AU99/00094 filed on 18/2/99 and as amended under PCT Article 19 on \_\_\_\_\_ (if any).



**ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR**

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

*(also check the following items, if desired)*

- ☐ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
- ☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

**PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))**

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

*(complete (d) or (e))*

- ☐ (d) no such applications have been filed.
- ☒ (e) such applications have been filed as follows.

*Note: Where item (c) is entered above and the international application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.*

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION  
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day/month/year)	PRIORITY CLAIMED UNDER 35 USC 119
AU	PP3111	18/2/99	<input checked="" type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)  
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

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*Note: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CIP APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.*

**POWER OF ATTORNEY**

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*list name and registration number*).

Thomas F. Peterson, 24790; Richard J. Streit, 25765; Timothy J. Keefer, 35567; Dennis K. Scheer, 39356; Douglas S. Rupert, 44434; Steven L. Schmid, 39358; Paul B. West, 18947; Joseph H. Handelman, 26179; Peter D. Galloway 27885; John Richards, 31503; Iain C. Baillie, 24090; Richard P. Berg, 28145

- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

**SEND CORRESPONDENCE TO:**

Thomas F. Peterson  
c/o Ladas & Parry  
224 South Michigan Avenue  
Chicago, Illinois 60604

**DIRECT TELEPHONE CALLS TO:**

(Name and telephone number)

(312) 427-1300

**DECLARATION**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.